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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,910	04/12/2004	Masahiro Kobayashi		2453

7590 06/22/2005

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EXAMINER

LE, DANG D

ART UNIT PAPER NUMBER

2834

DATE MAILED: 06/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/821,910

Applicant(s)

KOBAYASHI ET AL.

Examiner

Dang D. Le

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/3/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/3/05 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1-5 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

3. Claims 1-5 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Because the applicant amended the specification to indicate that the noncircular core made of non-permanent magnetic material (i.e. the noncircular core is not made of permanent magnet), it is not clear what material the central circular portion is made of. It is neither clear if the central circular portion is the shaft or just the inner periphery surface of the noncircular core.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukada (EP 1 321 744 A1) in view of Baird (2,805,677).

Regarding claim 1, Tsukada shows a variable reluctance resolver (Figures 8 and 9) wherein angular position is determined by detection of permeance between a rotor pole and a stator pole, the resolver comprising:

- A rotor (1) and a stator (2) wherein the rotor includes a noncircular core of magnetic material (there must be either permanent magnet or non-permanent magnetic material such as steel plate), which is rotatably supported inside the stator with a gap therebetween, the shape of the rotor being such that the

magnetic gap permeance varies according to a sine function of the rotational angle,

- Said noncircular core (1) including a central circular portion (31) and a plurality of salient poles (Figure 6) protruding on the periphery of the central circular portion.
- Wherein each salient pole (Figure 6) of the rotor has a center which is offset by a prescribed offset distance in the radial direction from the center of the rotor, and the outer peripheral shape of each salient pole comprises by an arc of a circle of radius r which is centered on the center of the salient pole and which does not extend to the inner peripheral surface of the stator (see Figure 6).

Tsukada does not show if the magnetic material being permanent or non-permanent.

Baird shows that the magnetic material could be either non-permanent (column 2, lines 5-9) or permanent (column 2, lines 15-16) for the purpose of providing regular excitation or extraneous excitation.

It is noted that in the art of motor and generator (resolver), it is well known to make the rotor with permanent magnet or non-permanent magnetic material. See Kolomeitsev et al. (6,784,582) for permanent magnet (18) and Maestre (5,300,884) for non-permanent magnetic material (11).

Since Tsukada and Baird are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

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It would have been obvious at the time the invention was made to a person having ordinary skill in the art to select either permanent or non-permanent magnetic material as taught by Baird for the purpose discussed above.

Regarding claim 2, the resolver of Tsukada modified by Baird includes all of the limitations of the claimed invention except for the radius $R_r = A \cos(\phi) + \text{square root of } \{r^2 - A^2 \sin^2(\phi)\} = A \cos(\theta/N) + \text{square root of } \{r^2 - A^2 \sin^2(\theta/N)\}$.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to set the radius $R_r = A \cos(\phi) + \text{square root of } \{r^2 - A^2 \sin^2(\phi)\} = A \cos(\theta/N) + \text{square root of } \{r^2 - A^2 \sin^2(\theta/N)\}$, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 3, the resolver of Tsukada modified by Baird includes all of the limitations of the claimed invention except for the gap $\delta = R_s - A \cos(\phi) - \text{square root of } \{r^2 - A^2 \sin^2(\phi)\} = R_s - A \cos(\theta/N) + \text{square root of } \{r^2 - A^2 \sin^2(\theta/N)\}$.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to set the gap $\delta = R_s - A \cos(\phi) - \text{square root of } \{r^2 - A^2 \sin^2(\phi)\} = R_s - A \cos(\theta/N) + \text{square root of } \{r^2 - A^2 \sin^2(\theta/N)\}$, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 4 and 5, it is noted that Tsukada also shows all of the limitations of the claimed invention in Figure 6.

7. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakano et al. (6,891,365) in view of Maestre (5,300,884).

Regarding claim 1, Nakano et al shows a variable reluctance resolver (Figure 1) wherein angular position is determined by detection of permeance between a rotor pole and a stator pole, the resolver comprising:

- A rotor (13) and a stator (12) wherein the rotor includes a noncircular core (13) of magnetic material (there must be either permanent magnet or non-permanent magnetic material such as steel plate), which is rotatably supported inside the stator with a gap therebetween, the shape of the rotor being such that the magnetic gap permeance varies according to a sine function of the rotational angle,
- Said noncircular core including a central circular portion (15) and a plurality of salient poles (Figure 1) protruding on the periphery of the central circular portion.
- Wherein each salient pole (Figure 1) of the rotor has a center which is offset by a prescribed offset distance in the radial direction from the center of the rotor, and the outer peripheral shape of each salient pole comprises by an arc of a circle of radius r which is centered on the center of the salient pole and which does not extend to the inner peripheral surface of the stator (see Figure 1).

Nakano et al. does not show if the magnetic material being permanent or non-permanent.

Maestre shows the magnetic material being non-permanent (11) for the purpose of providing regular excitation.

Since Nakano et al. and Maestre are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to select non-permanent magnetic material as taught by Maestre for the purpose discussed above.

Regarding claim 2, the resolver of Nakano et al. modified by Maestre includes all of the limitations of the claimed invention except for the radius $R_r = A \cos(\phi) + \text{square root of } \{r^2 - A^2 \sin^2(\phi)\} = A \cos(\theta/N) + \text{square root of } \{r^2 - A^2 \sin^2(\theta/N)\}$.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to set the radius $R_r = A \cos(\phi) + \text{square root of } \{r^2 - A^2 \sin^2(\phi)\} = A \cos(\theta/N) + \text{square root of } \{r^2 - A^2 \sin^2(\theta/N)\}$, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 3, the resolver of Nakano et al. modified by Maestre includes all of the limitations of the claimed invention except for the gap $\delta = R_s - A \cos(\phi) - \text{square root of } \{r^2 - A^2 \sin^2(\phi)\} = R_s - A \cos(\theta/N) + \text{square root of } \{r^2 - A^2 \sin^2(\theta/N)\}$.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to set the gap $\delta = R_s - A \cos(\phi) - \text{square root of } \{r^2 - A^2 \sin^2(\phi)\}$.

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$(\phi) = R_s - A \cos(\theta/N) + \sqrt{r^2 - A^2 \sin^2(\theta/N)}$, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 4 and 5, it is noted that Maestre also shows all of the limitations of the claimed invention for 2p lobes, p being an integer.

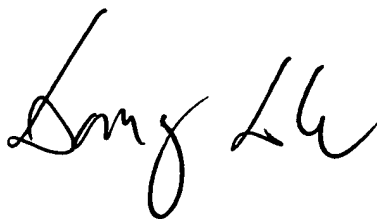
Information on How to Contact USPTO

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dang D Le whose telephone number is (571) 272-2027. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571) 272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

6/18/05



**DANG LE
PRIMARY EXAMINER**